Such a "national standard" establishing the minimum extent of ILECs' unbundling obligations is also crucial to achieving the purpose of the Act. No less than with the other duties imposed on ILECs under Section 251, the prospect of a patchwork quilt of 50 or more disparate network architectures and interconnection schemes can only increase the cost and complexity of new entry, or foreclose it altogether. Indeed, a consistent national approach may be even more important in matters of unbundling and interconnection, because network design and traffic engineering can be affected profoundly by economies of scale and seamless interconnectivity.

For these reasons, the NPRM (¶78) properly concludes that states (and the Commission) may require additional unbundling of ILEC networks. The Commission should, however, provide firm guidance in these matters, to assure compliance.[15] In particular, the Commission's order should make clear that states should mandate additional unbundling whenever it would be technically feasible and consistent with the procompetitive purposes of the 1996 Act. Such interests would be served, for example, if additional unbundling would create additional service options for consumers or enable an ALEC to have additional choices of suppliers. The Commission should further clarify that it will consider, and states may consider, whether an ILEC has complied with these additional requirements in any review undertaken pursuant to Section 252(e).

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[15] Although a few states, such as Hawaii and Louisiana, have issued orders requiring unbundling similar to that proposed by AT&T, those orders have not been implemented. Thus, for example, although the Hawaii Commission ordered unbundling of the eleven network elements identified by AT&T over nine months ago, unbundled elements are still not available in that state.

1. Loop Elements: Loop Distribution, Loop Feeder and Loop Concentrator.

The NPRM (¶¶94, 97) correctly concludes that ILECs should be required to provide local loops as unbundled network elements and that the Commission should require further unbundling of subloop elements. AT&T proposes that the minimum appropriate subloop elements should be:

> Loop Distribution - the customer-specific termination media (typically a twisted copper pair) that connect the network interface at a subscriber's premises to the equipment where loop distribution facilities from multiple subscribers are brought together;
>
> Loop Feeder - the transmission facilities used to transmit the aggregated traffic from many loop distribution facilities to an ILEC's central office; and
>
> Loop Concentrator/Multiplexer - a loop functionality which is used to concentrate and deconcentrate and/or multiplex and demultiplex traffic between loop distribution and loop feeder facilities (see also AT&T ex parte, pp. 12-13).

Each of the subloop elements uses a different type of facility or equipment or performs a different function and thus is logically separable from the others, and each is interconnected to the others using standard industry technical specifications and systems.[16] Thus, there is no question that such unbundling is technically feasible where ALECs employ equipment that adheres to such standards and interface with the ILEC through compatible systems. Moreover, there are important competitive reasons for requiring such unbundling. For example, CAPs using their own switches and fiber rings (for loop feeder purposes) may still need access to ILEC loop concentration and multiplexing functionality and loop distribution plant to connect with individual customer premises. Alternatively, cable providers with their own distribution plant may need

[16] See AT&T ex parte, p. 15 and Appendix A.

access to ILEC loop feeder facilities to aggregate traffic to the ILEC switch.[17] Thus, practical, technical and competitive reasons all support the unbundling of these subloop elements.

2. Switching Element.

The switching element performs multiple functions. First, it provides basic capabilities such as dial tone, basic switching, signaling, digit reception and other basic call processing features.[18] In addition, it provides access to transport facilities and operator systems, and may provide access to databases and adjunct processors. Some switches also have the advanced call processing capabilities available through AIN.[19] The NPRM (¶98) correctly concludes that ILECs must provide local switching capability as an unbundled network element, and it asks (¶99) how this element should be defined.[20]

The most appropriate definition of the switching element is that it encompasses all of the features and capabilities (including AIN triggers and AIN query capabilities where they are

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[17] Indeed, cable and PCS providers with their own distribution plant may only need access to customers' inside wire through the Network Interface Device ("NID"), which thus might also need to be unbundled. See AT&T ex parte, pp. 13-15 for additional examples showing the competitive need to unbundle the subloop elements.

[18] There are two types of switching: basic voice switching, which is used principally to provide voice services, and specialized data switching that is used to transmit packetized data (e.g., packet and frame relay switches). Each type of switching function should be made separately available to ALECs, so that ALECs not wishing to provide specialized data services do not need to incur costs for such capabilities and ALECs that have their own data switches are not obligated to use the ILEC's data switch.

[19] See AT&T ex parte, pp. 15-18 for a more detailed description of the functions performed by the switching network element and the technical feasibility of interconnecting with ILEC switches.

[20] The NPRM (¶103) also asks whether requirements for switching could be tailored to apply to the tandem switching element. If the latter were defined to include all of the capabilities of the tandem switch, AT&T would have no objection to adopting comparable rules for the tandem switching element, which is generally associated with the common transport function (see NPRM, ¶105). See also Part A.3 below (discussing transport elements).

installed) that the underlying ILEC switch is capable of providing. Thus, "switching" should not be narrowly construed to mean only a switch's ability to establish connections between lines and/or trunks. Such a definition is reminiscent of old cordboard or electromagnetic switches, not the sophisticated technologies that are used to provide switching functions today. Switches should be treated as entire units, not suppliers of individual functions, because all switching functions rely upon the integrated capabilities of a single switching system.

For this reason, the Illinois "local switching platform" better defines the switching element than the "port" model applied in New York, which the NPRM (¶101) recognizes is not an unbundled element at all, but "effectively equivalent to the LEC's bundled retail service offering minus the loop." Under the Illinois model, ALECs that purchase the switching element obtain the use of all of the capabilities of the ILEC switch, and not merely those the ILEC chooses to offer. This maximizes the incentives of ALECs to develop and offer services of their own design.[21] As shown in Part III below, it is feasible to develop appropriate rate elements to support this definition of the switching element.[22]

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[21] Such a definition also results in a sharing of economic risk between the ILEC and the ALEC, and a sharing of the service creation opportunities offered by sophisticated switching systems. This definition of the switching element also provides a sharp contrast between the purchase of an unbundled element under Section 251(c)(3) and the resale of retail services under Section 251(c)(4) (see Part B below).

[22] Defining the switching network element in this manner also resolves practical issues such as the pricing of individual capabilities of the switching element, because all such capabilities are included in the price. Further, this definition does not give ALECs any right to alter the operations of the ILEC's switch (see NPRM, ¶102). Although an ALEC could direct call processing and related functions that relate to calls to and from its customers, all switch programming and maintenance could continue to be handled exclusively by the ILEC.

3. Transport Elements: Dedicated and Common Transport and Tandem Switching.

There are two types of transport: dedicated and common. The former is used to provide a transmission path for the traffic of a single carrier, and the latter handles the traffic of multiple carriers. The NPRM (¶104) correctly recognizes that the Act requires the unbundling of transport, and that such unbundling is feasible given that existing technical standards support the provision of similar capabilities to interexchange carriers ("IXCs"). Thus, the NPRM (¶105) correctly concludes that ALECs should, for example, be able to obtain dedicated transport to connect local switches, to link serving wire centers ("SWCs") with IXC POPs, and to link central offices and SWCs, and they should also be permitted to obtain channel terminations separate from interoffice facilities.[23] In addition, the NPRM (id.) appropriately concludes that ALECs purchasing common transport should have the right to obtain it on an unbundled basis. ALECs should also be allowed to purchase tandem switching on an unbundled basis, so they may choose between the ILEC and other available suppliers (see also AT&T ex parte, pp. 20-23).[24]

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[23] ILECs currently offer IXCs the ability to use their Digital Cross-connect System ("DCS") capabilities, which enable the IXCs to use more cost-efficient high-speed facilities to route traffic to the ILEC and have it disaggregated into individual circuits at the DCS. ALECs should also have the opportunity to access such capabilities.

[24] The tandem switching element establishes a temporary communications path between two switching offices through a third switching office (the tandem switch) (see AT&T ex parte, p. 21). The tandem switch is located in a different part of the ILEC's network and typically provides a more limited set of functions than the local switch. Interconnections between transport elements and the access tandem are generally provided to IXCs pursuant to standard specifications. Thus, the NPRM (¶105) correctly recognizes that the access tandem could be offered as a separate unbundled element, and AT&T strongly urges the Commission to require such unbundling.

4. Databases and Signaling Systems: Signaling Links, STPs and SCPs.

Section 3(45) expressly includes databases and signaling systems within the definition of network elements. Thus, the NPRM (¶107) properly concludes that requiring ILECs to unbundle such elements "is consistent with the intent of the 1996 Act." Signaling System 7 ("SS7") signaling is critical in the provision of modern telecommunications services, because it allows signaling messages to travel separately from the voice path for individual calls, increasing efficiency and making possible a host of new signaling-based services. As explained in the AT&T ex parte (pp. 16, 23-24), SS7 signaling is used in the call set up process to pass billing and routing information, and it also allows the delivery of AIN messages that provide advanced services and call management capabilities. There are three network elements which together provide such signaling services: signaling links, which are the transmission paths that transmit SS7 messages between various points both internal and external to the ILEC signaling network; Signal Transfer Points ("STPs"), the "signaling switches" that enable the transfer of SS7 messages between other network elements; and Service Control Points ("SCPs") and databases, the network functionalities that contain the customer data and call processing algorithms used to provide special routing, information or call handling functions (see id., pp. 24-25).

Each of these network elements should be unbundled, so that ALECs can: (i) establish call set up between ALEC switches and between ALEC and other carriers' switches; (ii) access ILEC databases; and (iii) provide call processing instructions to ILEC switches from ALEC (or third party) databases for calls to or from ALEC customers. Competitive providers of signaling services have begun to emerge (see NPRM, ¶110), and ALECs should not be bound to obtain such elements only from ILECs. Unbundling will not only allow ALECs to "comparison

shop" to control their costs, but it will also foster competition in the provision of such advanced telecommunications capabilities.[25] Even with such competition, however, some existing databases (e.g., the toll free service ("800") databases and Line Information Data Bases ("LIDBs")) are large and may be prohibitively expensive to duplicate. Thus, even ALECs that provide some signaling capabilities for themselves (or obtain them from third parties) may still need to access some ILEC databases.

The NPRM (¶108) asks commenters to identify the signaling interconnections and ILEC databases that are available today. Currently, signaling D link connections are available between network providers' STPs (see AT&T ex parte, pp. 26-27), but ILECs typically restrict their use to call set up messages and LIDB queries to and from its network.[26] ALECs must be permitted to obtain D link connections from their STPs to ILEC STPs that will enable the carriers to exchange call set up information with other ALECs as well as the ILEC and to access the information in remote ILEC databases. Currently available ILEC databases include the 800 database, the LIDB, and, in some areas, AIN SCPs. Access to the 800 and LIDB databases is available now, and thus unbundling of these elements is technically feasible. Although AIN

[25] To the extent that the Commission determines that proprietary interfaces exist between ILEC STPs and signaling links and/or ILEC SCPs and STPs, and further that such interfaces should remain proprietary and exclusive to the ILEC, the Commission could require requesting carriers to access such ILEC SCPs through ILEC STPs. Nevertheless, each of these elements must be unbundled so that ALECs may purchase signaling elements from third parties where they are available.

[26] Signaling A link connections are also currently available. They are used to enable CAPs to connect their tandem switches with ILEC STPs and are tariffed as tandem signaling access service.

databases are not currently open to others, the technical interfaces for accessing them are identical to those for the 800 and LIDB databases and are equally technically feasible.[27]

For ALECs to deliver competitive services to customers, additional points of interconnection (or elimination of current interconnection restrictions) are necessary (see NPRM, ¶110). ILECs must be required to exchange the signaling messages needed to support CLASS features and to exchange AIN signaling messages between ILEC switches and ALEC SCPs via D link interconnections.[28] ALECs have a critical need for such interconnections, because without them, ALECs that operate their own switches cannot create and offer new IN-based services independent of the ILECs.[29] Thus, rules which preserve ILECs' ability to limit use of their D links would discourage ALECs from installing new switches, inhibit competition and reduce consumer options.[30]

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[27] When deployed, local number portability databases will presumably be available to other carriers in order to fulfill the number portability requirements of the 1996 Act (see Section 271(c)(2)(B)(xi)). In all events, ALEC access to remote databases will be increasingly important if ILECs continue to move intelligence out of the switch itself through the capabilities inherent in AIN technology.

[28] This requires that ILECs and ALECs agree upon an expanded signaling message set needed to communicate information for call processing. Although the messages for such exchanges are currently defined by Bellcore specifications, ILECs typically refuse to send them.

[29] Carriers other than local providers should also be able to offer IN-based services by obtaining these unbundled elements, and ALECs that offer IN services independent of the ILEC will also need to purchase local switch AIN capabilities independent of basic switching, as well as ILEC signaling links and STPs to enable them to deliver IN services to their customers. If unbundled signaling explicitly includes the exchange of AIN signaling messages between ILEC switches and non-LEC or ALEC SCPs, then the Commission need not pursue Docket CC No. 91-346 further, because its objectives will be met in this proceeding (see NPRM, ¶114).

[30] All of the capabilities described above should be provided on a generic basis for entire databases, and should not be defined as separate services.

Nondiscriminatory ALEC access to ILEC databases also requires that ALECs have the same ability as ILECs to place customer-specific information in ILEC databases. Thus, for example, ALECs must also have access to the ILEC administrative databases that are used to input validation data into LIDB and customer information into the E911 Automatic Location Indicator database and the directory and directory assistance databases. The conditions applicable to ALEC interconnections with such databases (e.g., the type of media required and the electronic information transfer method used) should be identical to those the ILEC uses for itself (see Section 251(c)(2)(C)).

Access to messages transmitted through ILEC signaling systems raises no proprietary information or network reliability issues. Such access is based on the signaling message generation function in the ILEC's switch,[31] and is provided through the ILEC provisioning process in which the ILEC itself inputs requested changes upon receipt of orders from ALECs or other eligible purchasers. Thus, the requesting carrier will not directly access the ILEC switch or have any physical control over its operation.

5. Operator Systems.

The NPRM (¶116) correctly concludes that ILECs should be required to unbundle "operator call completion services" as a separate network element.[32] Such systems are segregable, readily accessed and necessary for ALECs that do not have comparable systems (see AT&T ex parte, pp. 18-20). In contrast, they are unnecessary for ALECs that do have comparable systems.

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[31] AIN capabilities in the switch include provisioning of triggers and launching of TCAP messages that contain routing information needed to deliver messages to the appropriate AIN SCP.

[32] Although the NPRM and Section 271(c)(2)(B)(vii)(III) refer to "operator call completion services," in the context of defining unbundled network elements, it would be more appropriate to refer to the "operator systems" used to provide such services.

ILECs' operator systems are used to provide two types of functions: directory assistance and other operator functions. Each of these capabilities is separately available to carriers today, and each is individually referenced in Section 271(c)(2)(B)(vii), which requires that each of these functions be made available on a nondiscriminatory basis.[33]

B. The Terms And Purpose Of The Act Require That ALECs Have Maximum Flexibility In Combining Unbundled Network Elements To Provide Telecommunications Services.

ALECs have a statutory right under Section 251(c)(3) to "combine" unbundled network elements in any manner that is "technically feasible" to provide any "telecommunications service." Accordingly, ILECs should not be permitted to place any limitations on ALECs' ability to combine unbundled elements together, or with any technically compatible equipment, to provide services to the public. In particular, ILECs should be forbidden to impose requirements on an ALEC based on the services that the ALEC proposes to offer (see NPRM, ¶90), or to vary the definition of the element based upon such services, except with the consent (or at the request) of the ALEC. Nor should ILECs be permitted to place any limitations on the services ALECs may offer to consumers through the purchase of unbundled ILEC network elements, or to restrict in any way an ALEC's resale of an unbundled element. In addition, ILECs should be required to combine network elements in any technically feasible manner requested by ALECs.[34]

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[33] The NPRM (¶116) also correctly concludes that the Act requires the separate unbundling of "subscriber numbers" and "information sufficient for billing and collection or used in the transmission, routing or other provision of a telecommunications service." ALECs will need ILECs to perform screening on ALEC subscribers' telephone numbers or lines separately from the ILECs' screening for their own customers in order to correctly route operator services and directory assistance calls to ALEC platforms.

[34] When the ILEC combines contiguous network elements for an ALEC in a manner the ILEC itself interconnects such elements, there should be no additional charge for such interconnection, because the TSLRIC for each element includes those costs (e.g., the TSLRIC

(footnote continued on following page)

The NPRM (¶85) also seeks comment on the relationship between the ILECs' obligation to offer network elements under Section 251(c)(3) and their obligation to offer services for resale under Section 251(c)(4), and whether an ILEC may prohibit an ALEC from combining network elements so as to offer the "same services" that the ILEC separately offers for resale. As a preliminary matter, any suggestion (see id., n.113) that ILECs could refuse to permit ALECs to combine network elements to offer services similar or even identical to those offered by the ILECs is foreclosed by the "specific statutory language" (id., ¶85) of Section 251(c)(3). In all events, the suggestion that combining a platform of network elements under this provision of the Act is indistinguishable from obtaining and reselling service under 251(c)(4) ignores the fact that the purchase of network elements and the resale of ILEC services are fundamentally different legal and economic relationships, as the NPRM recognizes, and that they present vastly different opportunities and risks for the ALEC.

In particular, the competitive opportunities available under Section 251(c)(3) are very different from those available under Section 251(c)(4). Although resale is a necessary and important part of the transition to a vigorously competitive local service market, the scope of competition available through resale is limited: among other things, ALECs can only buy and resell those services that ILECs choose to make available to retail customers. In contrast, an ALEC that purchases network elements may use them to develop and offer additional and different

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(footnote continued from previous page)

for the switching element includes the switch-related costs of interconnection with loop feeder plant, and the TSLRIC for loop feeder plant includes the costs of interconnecting with the switching element). ILECs should also be prohibited form disrupting service to existing customers by separating network elements that are ordered in combinations, except at the request of the ALEC.

services as well -- even if the ALEC uses no facilities of its own but relies exclusively on the ILEC's network elements. For example, if an ILEC chooses not to make certain features available to some customers, an ALEC reseller likewise could not offer that service to its customers. But. ALECs that purchase unbundled network elements could combine the ILEC network capabilities to offer the service the ILEC does not. Thus, an ALEC buying unbundled elements could offer Centrex services to end users, notwithstanding the withdrawal by the ILEC of its own retail Centrex offering.[35] In addition, an ALEC that has purchased the right to use the available software in an ILEC's switch may be able to use those capabilities to develop and market new services the ILEC has not yet developed or offered (see NPRM, n.114).

Equally important, ALECs that purchase unbundled elements can offer a higher average level of service quality than carriers that operate through resale, or even the ILEC itself For example, ILECs' local loops are typically the oldest technology in their local networks. ALECs purchasing services under Section 251(c)(4) would have no greater right than ordinary customers to specify the type of local loop conditioning that ILECs provision to end users. Thus, ALECs must expect that the average loop quality they can offer to their customers is identical to the

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[35] See Part IV.A.1 below. Other potential ILEC offerings that are technically feasible have not been made available as services based on the ILEC's view of market demand (see Filing and Review of Open Network Architechture Plans, CC Docket No. 88-2, Phase I, Annual Report of Ameritech, dated April 15, 1996, Attachment 2, p. 2 (listing five technically feasible AIN-based services, including "Service Control Point Databases"); id., Annual Report of U S WEST, dated April 15, 1996, pp. 6-7 (noting that ONA services classified as "future" include both those that are technically infeasible and those which lack "market demand"). Further, the April 1996 filings of all RBOCs in CC Docket No. 88-2 indicate a high level of actual and anticipated deployment of both ISDN and AIN capabilities in their networks. ALEC access to such ILEC capabilities under Section 251(c)(3), together with the increased marketing focus that would be attendant on such access, could expand customer acceptance and utilization of these advanced technologies.

average performance of the ILEC's local loops as a whole. ALECs purchasing unbundled elements, however, could request (and would pay for) specific types of loop conditioning for their customers, e.g., conditioning that would better support the data transmission need of 28.8 Kbps modems, or that would permit customers to upgrade to ISDN service without additional installation.

Finally, the purchase of unbundled elements obviously enables ALECs to transition more easily to the provision of facilities-based services. Initiating service under Section 251(c)(3), rather than 251(c)(4), would be more cost-effective for carriers that are elsewhere using, or planning to use, facilities-based serving arrangements. For example, an ALEC is more likely to invest in the extensive deployment of network equipment such as switches if it can test the broadest possible market before making large-scale investments. Thus, an ALEC would be more likely to place one switch if it could offer a uniform set of services in a marketing region that includes areas outside those served by its single switch. To do this, the ALEC would not only need to purchase unbundled network elements in the area directly served by its switch, but it may also need similar arrangements in the surrounding areas where it hopes to expand its facilities-based operations in the future. This would be especially true if the services the ALEC plans to offer require the use of non-ILEC SCPs or databases. In such case, the ALEC could only assure a unified service offer if it could obtain unbundled elements in the surrounding areas that enabled it to interconnect the ILEC switch with those databases. This would provide the ALEC a better market test for whether it should make additional investments in the future.[36]

[36] See NPRM, ¶75 (recognizing that the statutory unbundling requirements are intended to encourage such gradual investment).

At the same time, the different competitive opportunities for ALECs under Section 251(c)(3) may require the ALEC to assume different financial risks, or different economics. An ALEC reseller will purchase from an ILEC under 251(c)(4) only those services requested by its customers, but will presumably continue to pay the prevailing exchange access rates in respect of toll traffic that the ALEC originates or terminates for its local customers. In contrast, under Section 251(c)(3), the ALEC will be purchasing certain capacity in one or more network elements -- without regard to or limitation on the services that can be provided therewith. The ALEC may thus be paying more "up front" for elements purchased under Section 251(c)(3) -- and thereby properly assuming some of the financial risk of (and fully compensating for) the ILEC's investment in the facilities -- but can profitably compete if it offers a wide range of attractive services using the network elements. In particular, when purchasing network elements under Section 251(c)(3), an ALEC that also provides toll service is not subject to prevailing Part 69 access charges (in contrast to Section 251(c)(4) resellers). The ALEC can also add features to its basic services (such as messaging and call waiting) to generate additional revenues.

C. A Uniform Definition Of "Technically Feasible" Is Critical To The Identification Of Both Unbundled Elements And Required Points Of Interconnection.

Section 251(c)(2)(B) requires ILECs to provide interconnection at all "technically feasible point[s]" in their networks, and Section 251(c)(3) requires them to unbundle network elements "at any technically feasible point." The importance of this term to the statutory framework makes it imperative that the Commission issue rules that can guide the parties and the states in determining technically feasible points of interconnection or identifying unbundled elements (see id., ¶50).

Most fundamentally, the Commission should adopt its proposal (¶58) that in any dispute concerning the technical feasibility of any requested interconnection, the ILEC has the burden of demonstrating that the requested interconnection would be technically infeasible. This is

necessary not only for the reason stated in the NPRM -- Section 251(c)(2)'s affirmative obligation on ILECs to provide interconnection at any technically feasible point -- but also because ILECs have substantial incentives to restrict the flexibility of competitors seeking to exercise their statutory right to such interconnections. Thus, ILECs should not be permitted to use unfounded technical arguments to retard ALECs' ability to offer comparable (or new) services to consumers and thereby reduce competitive alternatives in the marketplace.[37] The same burden of proof should also apply to any ILEC claim that unbundling a particular element, or providing a particular point of interconnection, would harm the network or threaten its reliability, or that access to such element or interconnection point would compromise ILEC proprietary information. In such cases, ILECs have similar incentives to restrict competition from ALECs, and, in any event, any data supporting those claims are most likely to be within the ILECs' control.[38]

AT&T agrees with the Commission that historical precedent is a key factor in defining "technically feasible."[39] The NPRM (id.) recognizes that one of the best (and simplest) tests of technical feasibility is whether an ILEC has previously unbundled a particular network element or provided a specific point of interconnection to any other carrier. In addition, the

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[37] For example, ILECs should not be allowed to claim, as BellSouth has, that an interconnection proposal is infeasible simply because it may require development work to assure that the point of interface is secure, maintainable or provisionable. See, e.g., Letter of B. Almond, BellSouth, to W. Caton, October 20, 1995, CC Docket No. 91-346.

[38] Even if the ILECs bear the burden of proof on technical unfeasibility claims, they can slow the competitive process by unduly extending any proceedings that address such issues. In order to prevent unwarranted delays, the Commission should establish prompt deadlines within which the ILECs must prove such claims (e.g., 30-60 days) after receipt of an interconnection request.

[39] The 1996 Act does not incorporate any economic test, such as "economic reasonableness," in the determination of whether interconnection or unbundling should be required. All such issues are addressed by the requirements that interconnection and unbundled elements be provided at cost-based rates (see Sections 251(c)(2), 251 (c)(3) and 252(d)(1)).

technical experience of one ILEC should demonstrate technical feasibility for another ILEC with similar equipment. This type of experience also should usually foreclose claims of network harm and claims that the LECs' proprietary data or systems will be compromised.[40]

Historical precedent alone, however, is not the only means to determine which network elements are appropriate for unbundling. The existence of published industry interconnection standards is another way of demonstrating technical feasibility. When ILECs interconnect components in their own networks, they do so through interconnection of network elements that conform to industry technical standards. These standards take into account such matters as technical compatibility, performance, network reliability and service delivery quality. ALECs that can meet such standards should be allowed to interconnect their network infrastructure with ILECs' networks at ALEC requested points of interconnections.[41] However, the absence of existing technical standards does not mean that the proposed interconnection or unbundling is not technically feasible, and the burden of proof in this circumstance should remain on the ILEC.

D. National Standards To Assure Prompt And Nondiscriminatory Performance Of Ordering, Provisioning, Maintenance, And Billing Functions Are Essential.

The NPRM (¶89) asks whether the Commission should issue rules requiring ILECs to (a) comply with "minimum national requirements for electronic ordering interfaces" and (b) provide network elements to ALECs "using the appropriate installation, service, and maintenance intervals that apply to LEC customers and services." The short answer is that such

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[40] In some cases, practical availability may also provide an appropriate test. For example, only simple hand tools (principally a screwdriver) are needed to access the NID and substitute an ALEC's wires for the ILEC's in order to connect to the customer's inside wire.

[41] The existence of a proposed industry standard in the near-final stages of review should also be particularly compelling proof that a proposed unbundled network element or interconnection point is technically feasible.

rules are absolutely critical, because it is virtually certain that local competition -- if it evolves at all -- will at least initially depend almost exclusively on potential competitors' access to ILEC facilities under either Section 251(c)(3) or Section 251(c)(4). The ILECs' monopoly control over the operational support systems that perform the essential ordering, provisioning, maintenance, and billing for their network facilities can be as formidable an obstacle to entry as their control over the local networks themselves.[42] Indeed, if ILECs make it harder for customers to order and receive service from ALECs than from themselves, ALECs cannot be viable competitors.

AT&T's attempt to become a competitive local service provider in Rochester, New York underscores this reality. The ordering process with Rochester Telephone Corp. ("RTC") initially required manual processing of ALEC service orders. Thus, AT&T had to complete and fax to RTC a multi-page form for every individual customer that wanted to switch to AT&T, and RTC insisted that customers could not be changed until it faxed multiple documents to AT&T. AT&T was signing up between one and two hundred new customers daily, and therefore had to fax up to 1400 pages to RTC each day, which caused numerous errors and delays in implementing customer orders. And while these problems were intolerable even on that limited scale, the competitive impediments of manual processing would be significantly magnified if it were required in larger or more heavily populated areas where the volume of customer activity will be far greater.[43]

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[42] Although there will necessarily be differences in the information that must be submitted and processed under Sections 251(c)(3) and (c)(4), the ordering, provisioning, maintenance and billing processes should be comparable, and neither should be so onerous or expensive as to deter ALECs from either form of competition.

[43] In 1995 alone, residential customers changed interexchange carriers approximately 30 million times. Even a tiny fraction of that volume in the local exchange market would overwhelm a system that relies upon manual interfaces between ALECs and ILECs.

Section 251(c)(2) requires that access to network elements be provided under terms and conditions that are just, reasonable and nondiscriminatory. The nondiscrimination standard is straightforward: ILECs must be required to perform ordering, provisioning, maintenance and billing services for ALECs at the same level of quality, and within the same intervals, as they do for their own end-user customers -- so as to ensure that customers do not "perceive any differences in the quality of service provided by one carrier as compared to another" (NPRM, ¶91). Accordingly, the Commission "can and should prohibit an incumbent LEC from providing requesting carriers with access inferior to that which it provides itself" (see id.).[44] ILECs must also provide nondiscriminatory service from a carrier perspective as well, and thus should not be permitted to impose costs on ALECs that interface with their systems that are greater than the costs the ILECs themselves incur in interfacing with those systems.

In addition to providing equal treatment, ILECs should be required to meet certain minimum performance standards. In particular, ILECs should "make it as easy to switch local service providers as it is for customers to switch interexchange providers" (see id., ¶91). This rule

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[44] Such a requirement is a necessary predicate to fair competition, is mandated by the nondiscrimination requirement of Sections 251(c)(3) and 251(c)(4), and is supported by the Commission's precedents. See Report and Order, Policy and Rules Concerning the Furnishing of Customer Premises Equipment. Enhanced Services and Cellular Communications Services by the Bell Operating Companies, 95 F.C.C.2d 1117, 1135-36 (1983) (adopting safeguards to prevent BOCs from providing superior access, installation, and maintenance services to themselves than to competitive providers of CPE, enhanced services, and cellular services); Report and Order, Amendment of Sections 64.702 of the Commission's Rules and Regulations (Third Computer Inquiry), 104 F.C.C.2d 958, 1026-27 (1986) (requiring BOCs to provide competing enhanced service providers with comparably efficient interconnection "to control potential discrimination" by BOCs in favor of their own offerings); id. at 1041 (time periods for installation, maintenance, and repair must be the same for competing carriers as for BOCs' own offerings). It is also recognized by the Tennessee rules, which require ILECs to "provide nondiscriminatory automated operational support mechanisms, including modified CABS billing systems, to facilitate purchase of all elements of the wholesale local network platform." Tenn. Administrative Rules, Chapter 1220-4-8.

would support the procompetitive purposes of the 1996 Act, because ILECs will have an enormous unwarranted advantage in retaining their monopoly customer base if switching local carriers is a lengthy or laborious process for customers -- even if there is putative "equal treatment" because the ILEC makes it as difficult to switch from an ALEC to the ILEC as from the ILEC to an ALEC.

Four conclusions follow from these standards. First, the ILEC must be required, upon request, to provide the ALEC with electronic system-to-system interfaces to its operational support systems. Virtually every ILEC currently uses automated interfaces to internal systems to support and coordinate its ordering, provisioning, maintenance, and billing for network elements in serving its own subscribers.[45]

Second, such electronic interfaces must be provided, at a minimum, for four broad categories of transactions:

- Ordering -- the process by which an ALEC obtains the information it needs to place an order for an end-user with the ILEC (e.g., the telephone number the end-user will be assigned).

- Provisioning -- the process by which an order is placed and filled, including, for example, the sending of a service order, the provisioning and installation of that order within the ILEC network and at the customer's premises (if necessary), directory listing, customer information for 911, confirmation of completion by the ILEC, and transmission of any jeopardy or reject notices.

- Maintenance/Repair -- all communications relating to planned and unplanned disruptions in service, including notification by the ILEC of events that are affecting

[45] Such interfaces need not involve direct access between ALECs and the ILEC systems. Both the ILEC and ALEC can establish separate "gateway" interfaces for the exchange of the necessary information. The ALEC gateway would connect to the ILEC gateway, and the ILEC gateway (but not the ALEC gateway) would connect directly to the ILEC's systems. Such a system would be more suitable for the development of a single set of national standards than direct access. Moreover, gateways would eliminate any claim that electronic interfaces could either cause harm to the ILEC network or risk disclosure of proprietary ILEC or customer information to the ALEC. A graphic depiction of the operation of such gateways is attached as Appendix B hereto.

or will affect the network, reports of difficulties by subscribers, and the dispatch of repair services.

- Billing -- the ILEC's transmission of the customer's usage data to the ALEC.[46]

Third, many of these information exchanges must take place in "real time," so that new entrants can offer consumers convenient and effective service. For example, customers ordering new telephone service typically can obtain the telephone number they will be assigned during the initial transaction in which they place the order with the ILEC representative. Similarly, ILEC customers generally can have a repair appointment scheduled in the same conversation in which they report a service problem. For these types of customer interactions, ALECs must have the same ability to interface with the ILEC systems in "real time," so that consumers can get the information they need promptly.

Fourth, national standards for interface to these systems must be developed. Such standards should address not simply the protocols and other issues relating to the transmission medium itself, but also the specific "transaction sets" that will be covered (e.g., the reporting of a service disruption) and the specific data elements that will be exchanged by the carriers for each

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[46] The exchange of all such information would, of course, be subject to the statutory prohibition against the use by any carrier for its own marketing purposes of another carrier's proprietary data or of CPNI. See NPRM, ¶115; 47 U.S.C. §§ 222(b), 222(c). In addition, the transmission of customer's usage data to the ALEC may not be adequate as such usage does not represent all of the calling completed for the customer. Calls billed to a third party number, or calling card and collect calls, represent calls recorded by one local provider but billed by another, and are not included in the usage feed provided to the ALEC. Today the BOCs, jointly through Bellcore, operate the Centralized Message Distribution System (CMDS) network. This network provides for the nationwide exchange and settlement of messages billed by local providers other than the local provider recording the calls. In a competitive local environment all local providers, the ILECs as well as the ALECs, would need nondiscriminatory access to this network, whether it would continue to be provided by the BOCs or, potentially, by an independent party. In addition, all carriers would need to participate in the exchange and settlement process in connection with these calls. Accordingly, the Commission should make clear that it will expect ILECs, as part of their nondiscrimination obligations, to continue to participate in such cooperative industry practices.

such transaction.[47] The standards should also set required intervals and other quality measures to ensure appropriate performance by the ILECs.

The development of such standards is principally the responsibility of the industry's standard setting bodies -- in this case, the Ordering and Billing Forum ("OBF") and other committees associated with the Alliance for Telecommunications Industry Solutions, which have already begun work on some of these issues. However, Section 256(b)(1) of the 1996 Act establishes an "oversight" responsibility for the Commission in the development of industry standards. That function is particularly important here, because of the critical role that access to ILEC facilities will play infostering local competition. By assigning that work to the OBF, setting a date for completion, participating in the OBF deliberations, and making clear that national standards are necessary to implement Sections 251(c)(3) and 251(c)(4), the Commission could spur the development of essential standards that ILECs might otherwise seek to stall. The Commission could then set an implementation date for that standard, and the states would oversee the LECs' compliance.

Even before such standards are developed, each ILEC should be required to file quarterly reports that separately identify the time intervals for its performance of the ordering, provisioning, and maintenance functions for ALECs and for its own end-user customers, and

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[47] A "transaction set" refers to a particular type of information exchange between carriers. For example, an Address Verification Query is a transaction set that may be used by an ALEC to confirm a customer's address in the ILEC database. Each transaction set has its own "data objects" (such as, in this example, the customer's address) and the "data elements" that make up those data objects (e.g., the customer's zip code). Unless there is a single national standard specifying which transaction types must be made available and which data objects and data elements will be associated with each transaction type, ALECs will have to develop different systems to interface with the ILECs in each area in which they seek to compete, increasing the costs of, and inhibiting, multi-location entry.

summarizing any complaints it has received regarding that performance. Such reports will enable the Commission and interested parties to assess and compare the ILECs' execution of their responsibilities in these areas and will provide a basis for corrective action in the event of substandard or discriminatory performance.[48]

E. The Commission Should Expand Upon Its Prior Collocation Rules To Implement The ILECs' Statutory Duty To Offer Physical Collocation.

Section 251(c)(6) requires all ILECs to offer physical collocation at their "premises" on "rates, terms, and conditions that are just, reasonable, and nondiscriminatory." The NPRM (¶67) properly proposes to adopt national standards to implement this requirement. Collocation is a form of interconnection, and should be subject to minimum national standards for the same reasons that interconnection generally should be subject to such standards: to enable carriers to enter local markets on a national scale; to expedite the process by which interconnection agreements will be negotiated and arbitrated; to ensure uniform application of these new federal duties; and to further the procompetitive purposes of the 1996 Act nationwide.

The Commission has already considered collocation issues as they relate to the provision of transport and adopted rules addressing many of those issues.[49] At the time those rules were adopted, however, there was no express statutory duty requiring the LECs to offer physical or virtual collocation, and the other interconnection rights of competing carriers were far more limited than they are under the 1996 Act. Thus, while the experience of those proceedings can provide a

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[48] The Commission has previously required such reports in similar circumstances (see, e.g., Third Computer Inquiry, 104 F.C.C.2d at 1055-56).

[49] See NPRM, ¶67.

useful starting point for the rules to be issued here, the prior rules must be substantially broadened in order to effectuate the 1996 Act. There are four respects in which broader rules are required.[50]

First, as the NPRM (¶71) tentatively concludes, the rules should make clear that physical collocation must now be offered at "all buildings or similar structures owned or leased by the incumbent LEC that house LEC network facilities," as well as "structures housing LEC network facilities on public rights of way." Although the Commission's prior rules applied to a more limited set of LEC properties, Section 251(c)(6) applies the collocation requirement to all ILEC "premises," and the broad scope of this requirement is confirmed by the ILECs' related duty to provide interconnection and access to unbundled network elements "at any technically feasible point within the carrier's network" (see Sections 251(c)(2)(B) and 251(c)(3)).

Second, the rules should prohibit any restriction on the types of telecommunications equipment that carriers may collocate (see NPRM, ¶72). There are numerous types of equipment that could be effectively collocated today, and any list that attempts to define and limit them will quickly become obsolete as new technologies and new methods of competition develop. In particular, ILECs should not be permitted to impose artificial limits on an ALEC's ability to use the equipment that it concludes will make most efficient use of collocation.[51]

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[50] The Commission's existing virtual collocation rules remain in effect unless and until they are amended (see NPRM, ¶73).

[51] For example, some ILECs, while permitting ALECs to collocate SONET OC-48 ring terminals at their central offices, have refused to allow ALECs to use that space to connect OC-3 ring terminals to those OC-48s on the spurious ground that the OC-3s would not themselves be connected to the LEC equipment directly at that central office -- even though the OC-3s would be connected at other central offices of the LEC on the access ring as well as through the OC-48s, and even though such connections would maximize the efficiency and reliability of the OC-48s. Using the same rationale, some ILECs have likewise refused to permit ALECs to connect with other ALEC equipment collocated in LEC central offices. The Commission should make clear that such restrictions will not be permitted.

Third, the Commission's rules should give ALECs the option of choosing virtual collocation as an alternative to physical collocation. Virtual collocation would help "implement[ ]" the interconnection and unbundling requirements of Sections 251(c)(2) and 251(c)(3) and is thus authorized under Section 251(d)(1). An order requiring a virtual collocation option would also be sound policy, because in some cases virtual collocation will impose fewer costs on the ALEC and be easier to administer. There can be no legitimate basis for an ILEC in those circumstances to require physical collocation instead.

Finally, the rules should safeguard against unwarranted claims by ILECs that space limitations or technical issues justify a denial of physical collocation and the offering of virtual collocation as the sole collocation alternative (see NPRM, ¶72).[52] The 1996 Act imposes the burden on ILECs to "demonstrate[ ]" the applicability of those narrow exceptions in any specific instance in which they are invoked (see Section 251(c)(6)), and ILECs should be required to make a substantial and detailed showing in order to meet that burden.

The Commission should also require -- as it has before -- that when ILECs remodel or build new facilities, their plans reflect the likely demands of other carriers for collocation.[53] The Commission should further provide that an ILEC will not be excused from its obligation to provide physical collocation for space reasons unless it demonstrates that its own equipment that is taking up space in the building is actively being used and not merely warehoused, and that there is no practical way of offering additional physical collocation by any reasonable means, including

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[52] The Commission should confirm that the statutory requirement of just and reasonable rates and terms for collocation applies not only to use of the ILEC's space, but also to power for collocated ALEC equipment.

[53] See Expanded Interconnection, 7 FCC Rcd. at 7408.

rearrangement of its own equipment or leasing additional space. In the event physical collocation at the designated premises is genuinely not available, the ILEC should be required to provide the necessary trunking at no extra cost to enable the ALEC to connect to the designated equipment elsewhere, and establish a schedule for moving the interconnector into the designated premises once space becomes available.[54]

F. Both The 1996 Act And Section 332(c) Of The Communications Act Confer Plenary Federal Jurisdiction Over LEC-CMRS Interconnection.

The NPRM (¶¶166-169) seeks comment on whether LEC-CMRS interconnection arrangements fall within Section 251(c)(2). Three years before enactment of the 1996 Act, Congress comprehensively addressed the means by which LECs and providers of commercial mobile radio services ("CMRS") should interconnect.[55] As AT&T explained in its comments in CC Docket No. 95-185, the Commission has plenary jurisdiction under Section 332(c) of the Communications Act to order LEC-to-CMRS interconnection based on the principles of mutual compensation and nondiscriminatory rates for both interstate and intrastate traffic.[56] Prompt action

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[54] MFS Communications Company has made a constructive proposal for addressing issues of space allocation in the March 21, 1996 ex parte filing it made in CC Docket Nos. 91-141 and 94-97 (see Letter of March 21, 1996 from Mark Sievers to William F. Caton). AT&T agrees with MFS that ILECs should be required, among other things, to "include in their tariffs intervals for initial space availability, space expansions, power delivery, network cabling and capacity expansions to meet cross-connect demand and circuit establishment intervals for cross-connects" (id., p. 2).

[55] Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, Title VI, § 6002(b), 107 Stat. 312 (1993).

[56] See Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers; Equal Access and Interconnection Obligations Pertaining to Commercial Mobile Radio Service Providers, CC Docket No. 95-185, Comments of AT&T Corp. at 19-30 (filed March 4, 1996); Reply Comments of AT&T Corp. at 11-20 (filed March 25, 1996). The compensation arrangements and pricing standards developed by the Commission in this proceeding pursuant to Sections 251 and 252 could serve as a model for LEC-to-CMRS interconnection.